

**F/V Ocean Prowler**  
**Cruise Report OP-93-01**  
**Longline Survey of the Gulf of Alaska**  
**July 13-September 27, 1993**

**Prepared by**

**Michael F. Sigler and Harold H. Zenger, Jr.**

On September 27, 1993, the National Marine Fisheries Service, Alaska Fisheries Science Center (AFSC), completed the seventh annual longline survey of sablefish (*Anoplopoma fimbria*) resources of the Gulf of Alaska. The survey area extended from the western end of Umnak Island eastward to Dixon Entrance (Figure 1). This survey was designed to continue the time series (1979-93) of the Gulf of Alaska portion of the Japan-U.S. cooperative longline survey.

**OBJECTIVES**

1. Determine the relative abundance and size composition of the commercially-important species sablefish, shortspine thornyhead (*Sebastolobus alascanus*), and roughey and shortraker rockfishes (*Sebastes aleutianus* and *S. borealis*).
2. Determine the relative abundance and size composition of other groundfish species caught during the survey—Pacific cod (*Gadus macrocephalus*), arrowtooth flounder (*Atheresthes stomias*), and grenadiers (Macrouridae)—and the relative abundance of Pacific halibut (*Hippoglossus stenolepis*).

## VESSEL AND GEAR

Survey operations were conducted using the F/V *Ocean Prowler*, a chartered U.S. longline vessel. The 47-m (155-ft) vessel carried standard longline hauling gear and was equipped with radios, radars, GPS receivers, LORAN receivers, video and paper track plotters, a processing line, three sets of plate freezers, and refrigerated holds. Vessel personnel consisted of a captain, an engineer, a cook, six fishermen, and six processors.

Gear configuration was unchanged from that of the 1988-92 surveys. Units of gear (skates) were 100 m (55 fm) long and contained 45 size 13/0 Mustad<sup>1</sup> circle hooks. Hooks were attached to 38-cm (15-in) gangions that were secured to beackets tied into the groundline at 2-m (6.5-ft) intervals. Five meters (16 ft) of groundline were left bare at each end. Gangions were constructed of medium lay #60 thread nylon, beacket material was medium lay #72 thread nylon, and groundline was medium lay 9.5-mm (3/8-in) diameter nylon.

A set of gear consisted of a flag and buoy array at each end followed sequentially by a 9.5-mm diameter nylon buoyline, a 92-m (50-fm) section of 9.5-mm polypropylene floating line, a 16-kg (35-lb) piece of chain (to dampen the effect of wave surge on the buoyline), 92 m of 9.5-mm nylon, a 27-kg (60-lb) halibut anchor, and 366 m (200 fm) of 9.5-mm nylon. The groundline was weighted with 3.2-kg (7-lb) lead balls at the end of each skate. Hooks were hand baited with chopped squid (*Illex* spp.) at a rate of about 5.7 kg (12.5 lb) per 100 hooks. Squid heads and tentacles were not used for bait.

Total groundline set each day was 16 km (8.6 nmi) long and contained 160 skates and 7,200 hooks. Two 80-skate groundlines laid end to end were set at each station along the upper continental slope. A single groundline of 80 skates was set at each station in the gullies.

## OPERATIONS

The charter began on July 13 at Unalaska, Alaska, and ended on September 27 in Juneau, Alaska. The charter period was divided into four legs of 25, 25, 12, and 13 days with a one-day port call after the first, second, and third legs. During Leg 1, the survey sampled from the western end of Umnak Island eastward to Shelikof Strait. Leg 2 began near Chirikof Island and continued eastward to Yakutat. During Leg 3, the area between Yakutat and

---

<sup>1</sup> Citation of the above brand name does not constitute U.S. government endorsement.

Sitka was sampled, and during Leg 4, the remainder of the area to Dixon Entrance was sampled.

The survey periods in 1991 through 1993 were 2-1/2 weeks later than in 1988 through 1990. From 1988 to 1990 the survey period was June 26 to September 12. The most recent three surveys were delayed to avoid the commercial fishing period that started 45 days later than in 1988 through 1990.

Seventy-seven days were used to complete the survey, including 65 days of survey sampling, a day each for loading and unloading gear, a day to treat an injured crewman, 5 days for travel, a day lost to bad weather, and 3 days for port calls.

### Survey Operations

Forty-five stations were sampled along the upper continental slope of the Gulf of Alaska at a rate of one station per day (Figure 1). Surveyed depths ranged from approximately 200 to 1,000 m, although at some stations depths less than 150 m or more than 1,000 m were sampled (Table 1). Twenty-seven stations were sampled in gullies at the rate of two stations per day. The sampled gullies are Shumagin Gully, Shelikof Trough, Amatuli Gully, W-grounds, Yakutat Valley, Alsek Strath, Spencer Gully, Ommaney Trench, Iphigenia Gully, and Dixon Entrance. One station (42) was sampled on the continental shelf off Baranof Island. Five stations were resampled to study catch rate variability.

The gear was set from shallow to deep and was retrieved in the same order, except on occasions when groundlines parted or sea conditions dictated that it be pulled from the opposite direction. Setting began about 0630 h Alaska Daylight Time. Retrieval began about 0930 h and was completed by about 1930 h.

### Data Collection

Catch data were recorded on a hand-held electronic data logger. During gear retrieval, a scientist recorded the species of each hooked fish, the condition of each unoccupied hook (absent, broken, or tangled), and whether bait remained on the hook. Time of day was recorded constantly from an internal clock and depth was entered when the first and last skates came aboard, at the beginning of each fifth skate, and when crossing into a new depth interval (0-100 m; 101-200 m; 201-300 m; 301-400 m; 401-600 m; 601-800 m; 801-1,000 m; and 1,001-1,200 m).

Length frequency data were collected with a bar code based measuring board and a bar code reader/data storage device. Length was measured by depth interval for sablefish, Pacific cod, grenadiers, arrowtooth flounder, rockfish, and thornyheads. Lengths of sablefish and Pacific cod were also recorded by sex. Pacific halibut were counted and released at the rail without

measuring. Catch and length frequency data were transferred to a computer and electronic back-up media twice a day.

As in the previous surveys, the charter vessel was allowed to retain most of the catch once the scientific data were recorded.

## **RESULTS**

One hundred and thirty longline hauls (sets) were completed (Table 1). Previously, strong currents at station 1 caused severe hang-ups resulting in extensive gear loss and damage. This year the station was permanently relocated eastward from the Islands of Four Mountains to the western end of Umnak Island.

Sablefish was the most frequently caught species, followed by giant grenadiers, Pacific cod, arrowtooth flounder, and thornyheads (Table 2). A total of 120,181 sablefish, with an estimated total round weight of 414,512 kg (913,584 lb), was taken during the survey (Table 3).

Preliminary analyses indicate that, since the 1992 survey, the relative abundance of sablefish on the upper continental slope of the Gulf of Alaska increased about 13%, whereas sablefish abundance in gullies decreased 7%. Continental slope station 28 showed the most notable increases. Sablefish abundance increased about 104% in the Umnak Island-Shumagin area (stations 1-10) to approximately 1990 levels. During the 1993 survey period, there were fewer observed incidences of commercial vessels occupying survey station locations in that area than in 1992. The highest sablefish catch was observed at station 39, near Sitka. Juvenile and subadult sablefish were relatively abundant at stations 3, 5, 14, 163, and 265 (Table 3).

More detailed results and comparisons to the results of previous surveys will be reported in a subsequent technical document.

## **SCIENTIFIC PERSONNEL**

### Leg I (July 13-August 6)

Harold Zenger, Field Party Chief, RACE  
Larry Haaga, RACE

### Leg II (August 8-31)

Michael Martin, Field Party Chief, RACE  
Brian Wood, RACE  
Alison Barns, REFM Observer Program, Kodiak

Leg III (September 2-10)

Larry Haaga, Field Party Chief, ABL  
Michael Sigler, ABL  
Jim Murphy, ABL

Leg IV (September 11-27)

Tom Rutecki, Field Party Chief, ABL  
Larry Haaga, ABL  
Jerry Pella, ABL

ABL - Auke Bay Laboratory  
RACE - Resource Assessment and Conservation Engineering Division  
REFM - Resource Ecology and Fisheries Management Division

---

For further information contact either

Dr. George Snyder, Director, Auke Bay Laboratory, National Marine  
Fisheries Service, 11305 Glacier Highway, Juneau, AK 99801-8626  
-Telephone (907) 789-6000

or

Dr. Gary Stauffer, Director, Resource Assessment and Conservation  
Engineering Division, National Marine Fisheries Service, 7600 Sand  
Point Way NE., Building 4, BIN C15700, Seattle, WA  
98115-0070-Telephone (206) 526-4170.

---